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OFFICIAL NEWSLETTER OF THE INTEGRATED PEST MANAGEMENT RESEARCH, DEVELOPMENT AND APPLICATIONS PROGRAM
2500 SHREVEPORT HIGHWAY • PINEVILLE, LOUISIANA 71360

New SPB Technology Transferred to Honduras

New approaches to the evaluation and direct control of southern pine beetle infestations recently have been introduced into Honduras, Central America. Threatened by a rapidly developing outbreak in the Yoro District of north central Honduras, the Honduran Forestry Department (Corporación Hondueña de Desarrollo Forestal) requested assistance from a forest entomologist experienced in bark beetle control. In response to this request, Dr. Ronald F. Billings, head of the Texas Forest Service Pest Control Section, spent the month of November in Honduras as a consultant for the USDA Office of International Cooperation and Development and the Agency for International Development.

As part of his mission, Ron spent 15 days with a Honduran counterpart traveling by jeep throughout the Yoro District to visit the remote and scattered infestations. At each infestation center, an evaluation was made of beetle activity, rates of spread, predators and associated insects present, extent of damage and control procedures in progress. Being fluent in Spanish from his Peace Corps days, Ron gave informal "on-the-spot" training sessions to field personnel and control crews about beetle behavior, spot growth, and proper methods for establishing control priorities. Cut-and-leave was demonstrated in several areas as a more practical and rapid method for controlling advancing infestations than the pile-and-burn method currently being used.

In addition to field demonstrations, guest lectures were given on the biology, control and prevention of southern pine beetle at the two Honduran forestry schools. Copies of IPM program publications, including Technical Bulletin 1631 and Agricultural Handbooks on aerial detection, ground checking, direct control, prevention and utilization were distributed

to key forestry personnel and to forestry libraries.

A series of fact sheets was prepared in Spanish for immediate distribution and use in the field. Tailored to conditions in Honduras, these fact sheets provided simple, step-by-step instructions on detection, ground checking, setting control priorities, various direct control alternatives and prevention. In addition, the report forms needed to establish a record keeping system on detection and control projects at the District level were formulated. Detailed results of field evaluations and one aerial detection flight, together with short and long-term recommendations, were summarized in a final report.

The current outbreak of *Dendroctonus frontalis* in Honduras appears largely limited to dense young stands of second-growth pine in the Yoro District, but may spread to neighboring districts having even more valuable forest reserves. To date, about 300 spots have been detected, ranging in size from 10 trees to 1000 acres. Most active spots are in overstocked stands weakened by repeated fires and resin extraction wounds.

The last major outbreak in Honduras occurred from 1962-1965 and remains the worst epidemic of southern pine beetle on record. Over $\frac{2}{3}$ of the virgin pine resources were destroyed in that epidemic, with infestations spreading at the rate of more than 300,000 acres per month. Due to the magnitude of that epidemic, lack of trained personnel and poor access, little could be done for control. In contrast, in the present situation the Honduran Forestry Department recognized the need for prompt action while infested areas were still relatively small. Now, equipped with some of the latest SPB evaluation and control technology, Honduran forestry personnel should be able to make sure that history doesn't repeat itself.

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SPB Technology Demonstrated To Texas Foresters, Timberland Owners, and Industry

A comprehensive display and demonstration of SPB decisionmaking and management technology was featured at the Texas Forestry Association annual meeting held in the Lufkin Civic Center recently. The Texas Forest Service, Texas A&M University, and the IPM Program provided and manned the display.

Materials were presented which described SPB damage and biology; forest/pest management decisionmaking; hazard rating techniques, applications and examples; utilization of beetle-killed timber; and the TFS integrated pest management demonstration project and portable sawmill.

Computer models were available for hands-on demonstrations by users. These included Texas A&M's SPB spot growth and population dynamics model, and a question analysis routine (FERRET) for SPB management decisionmaking. The Forest Service's IPM decision key, which provides information to the forest manager on management options for a variety of pests, was also available for interactive, hands-on use. A Texas Forest Service system featured methods for evaluating shade tree pests, spot growth projection and economic analysis, control decisions and infestation area calculations.

By the end of the one and one-half day meeting, the 283 TFA members attending the meeting had many opportunities to view, discuss, question, and/or try the latest technology for dealing with the SPB in east Texas. With beetle activity currently on the rise in Texas, the timing for the displays seems very appropriate for this historically active State.

Free Copies of the Following Publications Are Still Available

Coster, J. E., and J. L. Searcy, eds. 1979. Evaluating control tactics for southern pine beetle. Symp. Proc. Many, La. (January/February 1979). U.S. Dep. Agric. For. Serv., Tech. Bull. 1613. 118 p.

Coster, J. E., and J. L. Searcy, eds. 1981. Site, stand and host characteristics of southern pine beetle infestations. U.S. Dep. Agric. Comb. For. Pest R&D Prog., Tech. Bull. 1612. 115 p.

Stephen, F. M., J. L. Searcy, and G. D. Hertel, eds. 1980. Modeling southern pine beetle populations. Symp. Proc. Asheville, N.C. (February 1980). U.S. Dep. Agric. For. Serv., Tech. Bull. 1630. 174 p.

Send requests to: Program Manager, IPM Program, 2500 Shreveport Hwy., Pineville, LA 71360.

New Technology Transfer Plan Approved

The Regional Forester for the Southern Region, John Alcock, and the Director of the Southern Forest Experimental Station, Larry Lassen, recently approved a technology transfer plan that deals with the Utilization of Beetle-Killed Wood. The objective of the plan is to make the forestry community more aware of the usefulness of beetle-killed wood for a number of wood products and to encourage increased utilization at the expense of the beetle. Activities will be undertaken during fiscal years 1983, 1984 and 1985. Robert Westbrook, S&PF Sawmill Improvement Specialist in Pineville, LA, developed the plan.

A copy of the plan and information on proposed activities can be obtained by writing Bob Westbrook, Southern Region-S&PF, 2500 Shreveport Highway, Pineville, LA 71360.

Frontalure to be Tested in 1983

The use of behavioral chemicals to suppress SPB spots has been proposed since the late 1960's. Chemicals and procedures were developed and formulations tested. Plans were laid for broad scale testing of the attractant "frontalure" during the first year of the IPM Program, but were postponed as the result of declining beetle activity.

With SPB activity again on the upswing in late 1982, and good prospects for continuing Southwide activity in 1983, plans have been revived and tests are expected to be conducted during the coming season. Drs. Tom Payne (Texas A&M) and Wayne Berisford (University of Georgia) met recently in Dallas with Program Coordinators Hertel and Mason to finalize the study approach. The evaluation of the use of the attractant to disrupt spot growth will begin in early spring and center primarily in Texas and Georgia. Results should be available by the end of 1983 to establish if the procedure has utility. However, additional work may be required to provide operational and economic guidelines.

Though the use of pheromones for SPB control is still in the experimental stage, results from limited 1981-82 tests were very encouraging. Spot growth was disrupted in a number of infestations. The technique is not expected to replace traditional control measures, but will be a useful supplement in high-value areas where management policies or objectives restrict the use of the more common practices.

Integrated Pest Management Symposium Agenda Finalized

This is the promised update of a news item on the IPM Symposium that appeared in the Sept.-Oct. 1982 (Number 36) Pest Management News. The Symposium will take place in Athens, Ga., June 19-21, 1984. The Program Committee, made up of D. H. Gjerstad (Auburn Univ.), G. D. Hertel (South-

ern Forest Exp. Stn.), E. P. Hill (Miss. Cooperative Wildlife Research Unit), W. D. Kelley (Auburn Univ.), T. H. Miller (Southeastern Forest Exp. Stn.), H. V. Toko (Southern Region), and H. O. Yates III (Southeastern Forest Exp. Stn.), is happy to announce the following speakers:

Pest Complex					
Program Component	Insects	Diseases	Vegetation	Animals	Integration
IPM Concepts 0-5 yrs.	Jack Coster WV Univ.	A. L. Jones MI State Univ.	Jack Walstad OR State Univ.	Rex Marsh Univ. CA	N/A
Stand Mgmt. 0-5 yrs.	Roy Hedden Clemson Univ.	Bob Anderson Southern Region	Larry Nelson Auburn Univ.	Ed Hill Fish & Wildlife Svc.	Tom Terry Weyerhaeuser Co. and W. Leuschner VPI & SU
6 + yrs.	Evan Nebeker MS State Univ.	G. E. Kuhlman SE For. Exp. Stn.	W. Pope Potlatch Corp.	Ed Hill	
Seed Orchards	H. O. Yates SE For. Exp. Stn.	T. H. Miller SE For. Exp. Stn.	J. P. Jett NC State Univ.	Jeff Jackson GA Co-op. Ext. Svc.	Barry Malac and John Godbee Union Camp Corp.
Nurseries	Wayne Dixon FL Div. For.	Walt Kelley Auburn Univ.	David South Auburn Univ.	Jeff Jackson	John Mexal Weyerhaeuser

Predicting SPB Population Trends

Dr. William Mawby, in cooperation with Dr. Fred Hain at North Carolina State University and Coleman Doggett of the N. C. Forest Service, has analyzed southern pine beetle spot records in hopes of detecting patterns which may be used to forecast future outbreaks. These spot records were gathered from annual aerial surveys conducted during late summer or early fall. Several statistical methods have been applied to this information which covers the period from 1960 through the present.

As a result of these analyses, hope arose that a simple predictive method could be developed for forecasting spot totals for the upcoming year based on the previous year's totals. Such a scheme would be very helpful to a pest management specialist. The overall strategy of this approach is that certain counties serve as indicators of SPB activity for an entire State or region and can thus be used to forecast fu-

ture total infestation levels. In North Carolina, there is considerable evidence that such an approach may work. The investigator's methods utilized the "bootstrap" method of omitting several observations, fitting the model, and then testing the omissions. Also, some tests were performed using completely reserved data. Based on these tests, several equations were developed which appeared to give reliable results, including a model that required data from only one county 1 and 3 years previous to the year of prediction.

The resulting predictions from these models are now being tested using new infestations. To date, the predictions appear to overestimate outbreak trends, but the predicted upward trend is definitely occurring. Furthermore, due to the later fading of trees in North Carolina than observed in the deeper South, it is suspected that the number and size of active spots may actually be greater, and the prediction more accurate than preliminary results indicate.

For additional information, contact Drs. Bill Mawby or Fred Hain, Dep. Entomol., NC State Univ., Raleigh, NC 27607, tele. 919/737-3804.

Yield Prediction for Slash Pine Available for Unthinned Stands With and Without Fusiform Rust

Dr. Warren Nance, USDA-Forest Service, Southern Forest Experiment Station, has modified the plantation yield system, USLYCOWG (Unthinned Slash and Loblolly Yields for Cutover Sites in the Western Gulf) to develop yield predictions under different levels of fusiform rust infection. This, for the first time, allows the forest manager to consider rust impact and to develop rational and economic disease management strategies.

If you would like additional information, write or call Dr. Nance: Forestry Science Laboratory, Box 2008 GMF, Gulfport, MS 39503 (601-864-3972).

Manufacture and Marketing of Paneling from Beetle-Killed Pine Timber

It is generally agreed that one of the principal solutions to the beetle-killed pine timber (BKPT) problem in the South is increased utilization of the affected trees. One example of utilization takes advantage of the special characteristics of BKPT in the manufacturing of paneling. This "wormy pine" raw material is a new product manufactured by Quality Woodworks, Inc., Jasper, Florida.

Mr. Carl Ivey Carter, the owner of Quality Woodworks, Inc., is a sawtimber and pulpwood broker and does his own logging. He has trained his crews to select those trees that meet his standards for "wormy pine" and to hand-pick other trees with unusual grain pattern and color to provide the woodworking operation with its specialized wood raw material requirements.

Through experimentation, Mr. Carter developed several guidelines for the selection and profitable conversion of the BKPT into speciality paneling. Slash and longleaf pines with "tight grain" (seven or more growth rings per inch) are preferred over loblolly pine because of its less desirable fast growth and loose grain characteristics.

Selected pines must have been dead 90-180 days to develop the "character" desired for wormy paneling. Blue-staining and the insect holes and galleries must be visually prominent but the wood must remain sound and machinable. To test for soundness, an axe is used to cut into potential trees. If the sharp edge cuts the wood, the tree is acceptable; if the axe crushes or breaks the wood, the tree is rejected. Other

criteria used to select trees are based on visual evaluation. All needles must have fallen and $\frac{1}{2}$ to $\frac{3}{4}$ of the bark must be gone. The loose and missing bark from trees and logs have given no logging or handling problems. However, Mr. Carter claims that sawing the dry BKPT requires saw sharpening twice as often as when sawing lumber from green pine logs.

Paneling is available rough-sawn or dressed to $\frac{3}{4}$ ". Planing the lumber sawn from BKPT is no different than dressing green pine. The lumber is air dried on the yard 8 to 10 months or is kiln dried to reduce moisture content below 15 percent. Kiln drying also kills insects that may remain in the wood. Air-dried paneling is fumigated with methyl bromide gas to eliminate any live insects that may be present and which may surface after installation.

Installation of the paneling is no different from that of other solid, wood paneling materials. Mr. Carter stresses that "wormy pine" paneling be used for decorative applications only—never for structural use. Because quality products require quality treatment, the company suggests that high pressure air be used to clean the frass or insect debris from the insect holes and galleries on the surfaces of its paneling just before installation. This gives a clean appearance to nature's workmanship. For a totally "rustic" look, the paneling can be installed "as is."

This article was prepared by Milton Applefield, Secondary Wood Processing Specialist, USDA Forest Service, Doraville, GA 30340.

New Study on SPB/Fungus Relationships Funded

The association of bark beetles and the fungi which they carry has been observed for many years. The blue stain fungus, which is carried on the outside of bark inhabiting insects, causes degrade in wood products. Fungi have been suspected of providing nutritional supplements to beetles and of speeding the rate of tree death. Recent studies by the Southern Forest Experiment Station suggest that two fungi, carried in the fungal tube of southern pine beetles, may play an important role in the development or collapse of beetle populations. Further studies should allow investigators to more definitively test this hypothesis.

A project, "Characterization of fungi associated with the southern pine beetle and their relationship to beetle population dynamics," has been funded as a part of a larger Program effort to characterize insect/host relationships. Principal investigator Bob Bridges feels that role(s) of fungi can be defined and that the results will fill an important gap in our understanding of factors causing beetle population change. Results will be incorporated into SPB population dynamics models and predictive systems.

Stand Hazard Rating Display Seen Southwide

In November of 1981, the Program management team put together a display on hazard rating for annosus root rot, littleleaf disease, fusiform rust, and southern pine beetle. The display was viewed at the following meetings:

Meeting	Location	Date	Sponsor/ Cosponsor
Pest Management Training	Woodworth, LA	Dec. 81	La. Office of Forestry
SE Section-SAF	Mobile, AL	Jan. 82	IPM Program
Appalachian SAF	Asheville, NC	Jan. 82	S&PF-Forest Pest Mgmt.
IPM Coordination	Asheville, NC	Mar. 82	IPM Program
Florida SAF	Gainesville, FL	Mar. 82	IFPM Co-op.
SE For. Exp. Stn. dedication	Asheville, NC	Apr. 82	SE For. Exp. Stn.
Reg. II (SAF) Tech. Conf.	Baton Rouge, LA	May 82	IPM Program
Mississippi SAF Planning for Regeneration	Oxford, MS	June 82	IPM Program La. Forestry Assn.
Landowner Conf. & Tour	Alexandria, LA	June 82	La. Forestry Assn.
Pest Management Training County Fair	Alexandria, LA	Sep. 82	VA Div. of Forestry
	Roanoke, VA	Sep. 82	Homochitto Nat'l. For.
	Bude, MS	Sep. 82	LA Co-op. Ext. Serv.
Parish Fair	Oberlin, LA	Oct. 82	IPM Program
Louisiana SAF Southern Silvicultural Res. Conf.	Many, LA	Oct. 82	IPM Program
Texas SAF Loblolly Pine Symposium	Atlanta, GA	Nov. 82	IPM Program
	Lufkin, TX	Nov. 82	IPM Program
	Raleigh, NC	Dec. 82	IPM Program

This display is available on loan from the IPM Program. We also have a display on southern pine beetle and one on utilization of beetle-killed pine.

If you are interested in using any of these displays, contact the Applications Coordinator, IPM Program, 2500 Shreveport Highway, Pineville, LA 71360.

Integrated Forest Pest Management Cooperative Begins Second Year

The Integrated Forest Pest Management Cooperative moves into its second year of activity in 1983. The Cooperative is regional in scope and includes State forestry agencies, forest industries, the Southeastern Forest Experiment Station, and the University of Florida School of Forest Resources and Conservation and Department of Entomology and Nematology. The objectives of the IFPM Co-op are to

identify and test biologically effective, environmentally safe, and economically sound pest management practices under semi-operational conditions so that results will be compatible with silvicultural and forest management practices. The following projects are underway:

1. Seed orchard pest monitoring.
2. Biological control of sawflies on slash and longleaf pines.
3. Pitch canker disease management.
4. Evaluation of annosus root rot control.
5. Efficacy of salvage-sanitation cuttings in fusiform rust-infected plantations.
6. Shelterwood regeneration to manage fusiform rust in high hazard areas.
7. Best management practices for fusiform rust in high hazard areas.
8. Role of inoculum in the fusiform rust epidemic.
9. Life table and pest inventory system.

A new brochure explaining the goals, program and personnel of the Co-op is now available. A copy can be obtained from the School of Forest Resources and Conservation, University of Florida, 118 Newins-Ziegler Hall, Gainesville, FL 32611.

User Center for Integrated Pest Management Decision Key Established

Forest Pest Management-Region 8 now has a user friendly, computerized Integrated Pest Management Decision Key (IPM-DK) User Center designed to give land managers preventative and remedial control options for protecting their trees against pests. The User Center was established to accommodate those managers who have an interest in incorporating pest management recommendations into their forest management plans or in using control options in operational programs. The service is free of charge.

There are two ways to access the User Center:

1. If you have an interactive computer terminal, call 404/221-5200 to access the computer. You will be asked to provide certain easily obtained information. In return, you will receive pest management options almost instantly. If you run into problems or have questions about the program, call Robin Pierce at 404/881-2961, or
2. Obtain a IPM-DK User Center form from the IPM-DK Coordinator, USDA Forest Service, Room 706, 1720 Peachtree Road, N.W., Atlanta, GA 30367, and (a) Fill out the form and mail to the above address, or (b) Call Robin Pierce, give her the information from the form, and she will send you a print-out of the management options.

FY 1983 IPM Program-Funded Projects

State	Performing Organization(s)	Principal Investigator(s)	Title of Project
Alabama	Ala. For. Comm.	J. R. Hyland R. C. Kucera	**Integrated management of southern pine beetle and annosus root rot in Alabama.
Arkansas	Univ. of Arkansas—Fayetteville	F. M. Stephen T. D. Paine H. A. Taha	Evaluation of host tree resistance and its effect on southern pine beetle population dynamics.
Florida	Univ. of Florida SE For. Exp. Stn. Univ. of Florida Union Camp Corp. SE For. Exp. Stn.	J. L. Foltz R. C. Wilkinson R. P. Belanger T. Miller R. S. Webb J. F. Godbee C. W. Fatzinger I. L. Williams	Sampling and dynamics of bark-infesting beetles in slash pine plantations. Forest management strategies for preventing or reducing beetle- and pathogen-caused losses: silvicultural treatment of planted stands in the Atlantic Coastal Plain. Development and evaluation of a trapping system, using host-produced behavioral chemicals, for preventing attacks by the black turpentine beetle, <i>Dendroctonus terebrans</i> (Oliv.), and engraver beetles, <i>Ips</i> spp., in naval stores areas.
Georgia	Univ. of Georgia Univ. of Georgia SE For. Exp. Stn. Univ. of Georgia	C. W. Berisford L. H. Kudon C. W. Berisford R. F. Mizell, III G. A. Koenigshof J. R. Beckwith J. T. Rice M. D. Connor D. A. Starkey S. Weaver R. J. Uhler W. N. Nettleton J. R. Bridges	**Impact of hymenopterous parasites on populations of southern pine and <i>Ips</i> spp. beetles: Validation of a conceptual model of parasite-host interactions. **Colonization and brood production of southern bark beetles in slash residue: (1) Population estimates of attack/emergence, (2) The effect of slash size and age. Determining technical properties and economic feasibility of COM-PLY panels made with flake-board cores containing beetle-killed southern pine wood, Phase III. Integrated pest management on National Forests: Demonstration project on the Holly Springs NF in Mississippi.
Louisiana	Region 8, S&PF Holly Springs NF Region 8, S&PF So. For. Exp. Stn.	P. L. Lorio, Jr. R. A. Sommers J. D. Hodges T. E. Nebeker D. M. Moehring J. D. Hodges T. E. Nebeker T. E. Nebeker J. D. Hodges	Characterization of fungi associated with the southern pine beetle and their relationship to beetle population dynamics. Interpretation of soil maps for identifying bark beetle hazards on the Kisatchie National Forest. **Intensive examination of soil physical properties following thinning operations under wet and dry soil moisture conditions. *Thinning practices and associated pest problems in southern pine. (State-of-the knowledge analysis).
Mississippi	Miss. State Univ.	F. P. Hain	Influence of thinning operations on southern pine susceptibility to pine bark beetles in Mississippi and Alabama.
N. Carolina	NC State Univ. NC State Univ. Duke Univ. SE For. Exp. Stn. Region 8, S&PF	F. P. Hain T. O. Perry W. A. Thompson J. M. Vasievich W. H. Hoffard S. W. Oak	The interactions of southern yellow pines, bark beetles and tree pathogens at low levels of the southern pine beetle. *Evaluating the reaction of southern pines to bark beetle attack. **Economic analysis of methods for reducing losses from bark beetles of southern pines. Integrated pest management on National Forests: Demonstration project on the Sumter National Forest in South Carolina.
S. Carolina	Clemson Univ. SC Comm. of For.	R. L. Hedden D. L. Ham F. H. Tainter M. C. Remion	**Integrated forest pest management in South Carolina.

State	Performing Organization(s)	Principal Investigator(s)	Title of Project
Texas	Texas A&M Univ.	R. N. Coulson T. L. Payne L. Hu E. Rykiel P. E. Pulley R. F. Billings R. N. Coulson P. E. Pulley T. L. Wagner	Decision-support system development for southern pine beetle management.
	Texas For. Serv. Texas A&M Univ.		Statistical modeling of pest population dynamics (TAMBEETLE) for use in southern pine beetle management, decisionmaking and development of preventative estimation procedures.
	Texas A&M Univ.	R. M. Feldman P. J. H. Sharpe H. Wu T. L. Payne C. W. Berisford R. F. Billings H. A. Pase C. Walker S. A. Alexander	Biophysical modeling of population dynamics for use in southern pine beetle management decisionmaking.
	Texas A&M Univ. Univ. of Georgia Texas Forest Service		**Development and evaluation of a behavioral chemical for southern pine beetle suppression.
Virginia	Virginia Polytech. Instit. & State Univ.		**Towards the integrated management of southern pine beetle in east Texas—Phase IV of the Polk and Tyler County demonstration area.
	Univ. of Virginia	P. J. Michaels	An annosum root rot prediction model for rating the susceptibility of loblolly pine to infestation by the southern pine beetle.
			**Improved specifications of the climatic component of southern pine beetle host susceptibility with multivariate statistical methods.

*Funded in FY 81.

**Funded in FY 82.

Southern Pine Beetle Slide-Tapes Available From SOUTHFORNET

A series of slide-tapes developed through the Expanded Southern Pine Beetle Research & Application Program were distributed by the Southern Region, Forest Pest Management (FPM) to key Federal agencies, Extension Service, and State Foresters. Numerous requests for additional slide-tapes prompted FPM to make them available at a reasonable cost to interested persons or agencies. The series are suitable for training and general informational usage. The slide-tapes can be obtained from SOUTHFORNET, University of Georgia. The prices and a description of each slide-tape are listed below.

1. Control methods for the Southern Pine Beetle (80 slides/16 minute tape) Cost—\$50.

This program describes in detail the four major treatment methods—salvage removal, cut-and-leave, chemical control, and pile-and-burn—recommended for SPB control.

2. The Biology and Identification of the Southern Pine Beetle (46 slides/7 minute tape) Cost—\$35.

This slide-tape presents a detailed description on how to identify pine attacked by

the SPB and describes the SPB, its various life stages, and associated insects.

3. Insects Associated with the Southern Pine Beetle (79 slides/14 minute tape) Cost—\$50.

Other bark beetles—pine engravers, black turpentine beetle, pine sawyers, ambrosia beetles—attack and sometimes kill pine. This program describes how to indentify these beetles, so they will not be confused with the southern pine beetle.

4. Building Among the Pines (121 slides/19 minute tape) Cost—\$70.

This program discusses protecting trees during construction and how to minimize the incidence of bark beetle damage to pines. Although this program emphasizes pines, the same protection principles apply to all forested sites.

5. Silviculture Can Reduce Southern Pine Beetle Losses (65 slides/9 minute tape) Cost—\$40.

This program covers the need for using good forest management practices to prevent or reduce SPB-caused mortality in pine stands. The presentation is in 3 parts, general silvicultural practices and specific recommendations for the Piedmont and Coastal Plain Regions.

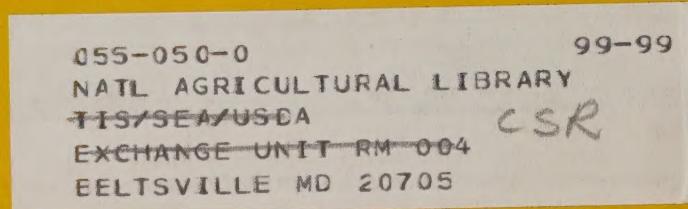
6. Chemical Control of Southern Pine Beetle (50 slides/9 minute tape) Cost—\$35.

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The slide-tape describes the use of 3 insecticides (Lindane, Dursban, Sumithion), for chemical control of SPB. Both preventive and remedial methods are presented.

Each slide-tape includes a script. The audio cassette tape has one side with audible tones for assisting manual slide changing and the other side with silent electronic signals for recorders with automatic slide changers. The price of the slide-tapes includes mailing and handling. To purchase, make a check or money order payable to "SOUTHFORNET." Send to: SOUTHFORNET, Science Library, University of Georgia, Athens, Georgia 30602.

being done by southern pine beetle and annosus root rot. Emphasis was placed on hazard rating pine stands and alterations in forest management practices necessary to prevent, control or reduce the impact of the two pests. At field stops, basal area (stocking) and radial growth were discussed as factors affecting stand hazard to southern pine beetle. Soil factors were discussed as they related to the incidence and severity of annosus root rot. Other topics included regeneration and prescribed burning. Improved agency cooperation and technical assistance to the landowner regarding woodland management should result from these training sessions.

Southern Pine Beetle, Annosus Root Rot Included in Multi-Agency Training in Mississippi

A series of nine multi-agency training sessions was held recently in Mississippi in an effort to better coordinate and unify State and USDA technical assistance to woodland owners. Participants from the Mississippi Forestry Commission, Soil Conservation Service, Forest Service and other USDA Agencies spent half a day in the classroom and half in the field studying several forestry topics. Personnel from the U.S. Forest Service Forest Pest Management field office in Pineville, Louisiana, were on hand at each session to discuss the potential and current damage

Other Publications

- Limit, M. J.; Stephen, F. M. Observations of trees resisting southern pine beetle attack. *J. Ga. Entomol. Soc.* 17(3): 351-356; 1982.
- Hicks, Ray R., Jr.; Mason, Garland N. Southern pine beetle hazard rating works in east Texas. *Southwest. Entomol.* 7(3): 174-180; 1982.
- Fargo, W. S.; Wagner, T. L.; Coulson, R. N.; Cover, J. D.; McAudle, T.; Schowalter, T. D. Probability functions for components of the *Dendroctonus frontalis*-host tree population system and their potential use with population models. *Res. Popul. Ecol.* 24(1): 123-131; 1982.